

Claims

## WHAT IS CLAIMED IS:

1. An absorbent material having a basis weight of from about 200g/cm<sup>2</sup> to about 400 g/cm<sup>2</sup>, a density of from about 0.35 g/cc to about 0.40 g/cc and a ratio of Gurley Stiffness (mg) to density (g/cc) of less than about 3700, wherein the material is airlaid as a bottom layer of pulp, a middle layer of pulp and superabsorbent material disposed in amongst the pulp, and a top layer of pulp.
2. The material of claim 1 wherein the pulp has a Kappa value of less than about 100.
3. An absorbent material comprising:
- a) from about 40 weight percent to about 90 weight percent cellulosic fibers; and
- b) from about 10 weight percent to about 60 weight percent superabsorbent material, the absorbent material having a water content of less than about 10 weight percent, a density of greater than about 0.25 g/cc, a ratio of Gurley Stiffness (mg) to density (g/cc) of less than about 3700 and a pad integrity of greater than about 12 Newtons.
4. An absorbent material comprising:
- a) from about 40 weight percent to about 90 weight percent cellulosic fibers; and
- b) from about 10 weight percent to about 60 weight percent superabsorbent material, the absorbent material having a water content of less than about 10 weight percent, a density of greater than about 0.25 g/cc, a ratio of Gurley Stiffness (mg) to density (g/cc) of less than about 3700 and which absorbent material retains more than about 85 weight percent of superabsorbent material after shaking for 10 minutes.

5. An absorbent material comprising:
- a) from about 40 weight percent to about 90 weight percent cellulosic fibers; and
  - b) from about 10 weight percent to about 60 weight percent superabsorbent material, the absorbent material having a water content of less than about 10 weight percent, a density of greater than about 0.25 g/cc, a ratio of Gurley Stiffness (mg) to density (g/cc) of less than about 3700, a ratio of Pad integrity (Newtons) to density (g/cc) of greater than about 25.0 and a 45° wicking distribution at 5 inches of at least 7 grams of saline per gram of absorbent material.
6. The material of any of claims 3-5 wherein at least some of the cellulosic fibers have a relative crystallinity of less than about 65 percent.
7. An absorbent material having a basis weight of from about 100 g/m<sup>2</sup> to about 500 g/m<sup>2</sup>, a density of from about 0.25 g/cc to about 0.50 g/cc, the material comprising a core including cellulosic fibers obtained from pulp having a Kappa value of less than about 100 and a layer of tissue superimposed on an outer surface of the core, wherein at least some of the cellulosic fibers have a relative crystallinity of less than about 65 percent.
8. The material of claim 7 wherein the core contains from about 40 weight percent to about 100 weight percent cellulosic fibers and from about 0 weight percent to about 60 weight percent superabsorbent material.
9. The material of claim 8 wherein the core contains from about 50 weight percent to about 80 weight percent cellulosic fibers and from about 20 weight percent to about 50 weight percent superabsorbent material.
10. The material according to any of claims 1-9 having a suppleness of greater than about 0.7 g<sup>-1</sup>.

11. The material of claim 7 wherein the tissue is crepe tissue.

12. An absorbent material having a density of from about 0.25 to about 0.5 g/cc and a suppleness of greater than about  $0.7 \text{ g}^{-1}$ , the material consisting essentially of:

a) from about 40 weight percent to about 90 weight percent cellulosic fibers at least some of which fibers are obtained from pulp having a Kappa value of less than about 100, wherein at least some of the cellulosic fibers have a relative crystallinity of less than about 65 percent; and

b) from about 10 weight percent to about 60 weight percent superabsorbent material.

13. The material of any of claims 1-12 that has normalized drying power energy of at least about 6000 ergs/g.

14. The material of any of claims 1-12 that has normalized wicking energy of at least about 3000 ergs/g.

15. The material of any of claims 1-12 that has normalized drying power energy of at least 6000 ergs/g and a normalized wicking energy of at least about 3000 ergs/g.

16. An absorbent material having a density of from about 0.25 g/cc to about 0.5 g/cc, a basis weight of from about  $200 \text{ g/m}^2$  to about  $500 \text{ g/m}^2$ , a suppleness of greater than about  $0.7 \text{ g}^{-1}$ , a normalized drying power energy of at least about 6000 ergs/g and a normalized wicking energy of at least about 3000 ergs/g, the material consisting essentially of:

a) from about 50 weight percent to about 90 weight percent cellulosic fibers at least some of which fibers are obtained from pulp having a Kappa value of less than about 100, wherein at least some of the cellulosic fibers have a relative crystallinity of less than about 65 percent;

- b) from about 10 weight percent to about 40 weight percent superabsorbent material; and
- c) a layer of tissue comprising from about 3 weight percent to about 20 weight percent of the absorbent material.

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17. The material of claim 16 wherein the tissue is crepe tissue.

18. The material of any of claims 3-17 wherein the cellulosic fibers have a relative crystallinity of less than about 60 percent.

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19. The material of any of claims 3-17 wherein the cellulosic fibers have a relative crystallinity of less than about 50 percent.

20. The material of any of claims 3-17 wherein the cellulosic fibers have a relative crystallinity of less than about 40 percent.

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21. The material of any of claims 3-17 wherein at least some of the cellulosic fibers are obtained from pulp having a Kappa value of less than about 75.

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22. The material of any of claims 3-17 wherein at least some of the cellulosic fibers are obtained from pulp having a Kappa value of less than about 50.

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23. The material of any of claims 3-17 wherein at least some of the cellulosic fibers are obtained from pulp having a Kappa value of less than about 10.

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24. ~~The material of any of claims 3-17 wherein at least some of the cellulosic fibers are obtained from pulp having a Kappa value of less than about 2.5.~~

25. ~~The material of any of claims 3-24 wherein at least some of the cellulosic fibers have been made by a process that includes the step of treating a liquid suspension of pulp at a temperature of from about 15°C to about 60°C with an aqueous alkali metal salt solution having an alkali metal salt concentration of from about 2 weight percent to about 25 weight percent of said solution for a period of time ranging from about 5 minutes to about 60 minutes.~~

26. ~~The material of any of claims 3-24 wherein at least some of the cellulosic fibers have been flash dried.~~

27. ~~The material of claim 25 wherein at least 25 percent of the fibers are made by the process.~~

28. ~~The material of claim 27 wherein at least 40 percent of the fibers are made by the process.~~

29. ~~The material of claim 28 wherein at least 50 percent of the fibers are made by the process.~~

30. ~~The material of any of claims 3-29 having a basis weight of from about 100 g/m<sup>2</sup> to about 250 g/m<sup>2</sup>.~~

31. ~~The material of any of claims 3-29 having a basis weight of from about 350 g/m<sup>2</sup> to about 450 g/m<sup>2</sup>.~~

32. ~~The material of any of claims 3-31 having a density of from about 0.30 to about 0.45 g/cc.~~

33. The material of claim 32 having a density of from about 0.35 to about 0.45 g/cc.

34. The material of any of claims 1-33 that contains from about 20 to about 40 weight percent superabsorbent material.

35. The material of any of claims 1-34 that has normalized drying power energy of at least 7000 ergs/g.

10 36. The material of claim 35 that has normalized drying power energy of at least 8000 ergs/g.

37. The material of claim 36 that has normalized drying power energy of at least 9000 ergs/g.

15 38. The material of claim 37 that has normalized drying power energy of at least 10000 ergs/g.

20 39. The material of any of claims 1-38 that has normalized wicking energy of at least 3500 ergs/g.

40. The material of claim 39 that has normalized wicking energy of at least 4000 ergs/g.

25 41. The material of claim 40 that has normalized wicking power energy of at least 5000 ergs/g.

30 42. The material of claim 41 that has normalized wicking energy of at least 7500 ergs/g.

43. The material of any of claims 1-42 that has normalized drying power energy of between about 6000 ergs/g and about 16000 ergs/g.

5 44. The material of any of claims 1-43 that has normalized wicking energy of between about 3000 ergs/g and about 10000 ergs/g.

10 *Sub H<sup>13</sup>* 45. The material of any of claims 1-44 that has a suppleness of greater than about 0.8 g<sup>-1</sup>.

46. The material of claim 45 that has a suppleness of greater than about 0.9 g<sup>-1</sup>.

47. The material of claim 46 that has a suppleness of greater than about 1.0 g<sup>-1</sup>.

15 *Sub H<sup>14</sup>* 48. An absorbent article comprising the absorbent material of any of claims 1-47.

20 49. The article of claim 48 that is a diaper, a feminine hygiene product or an incontinence device.

50. The article of claim 48 wherein the absorbent material is folded or cut into a multiple-ply structure